ATLAS MINERALS
PROCEDURES FOR
SEALING
BOREHOLES,
SHAFTS, AND
PORTALS

Prepared for the DOGM

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Atlas Minerals

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I. PROCEDURE FOR BOREHOLE SEALING

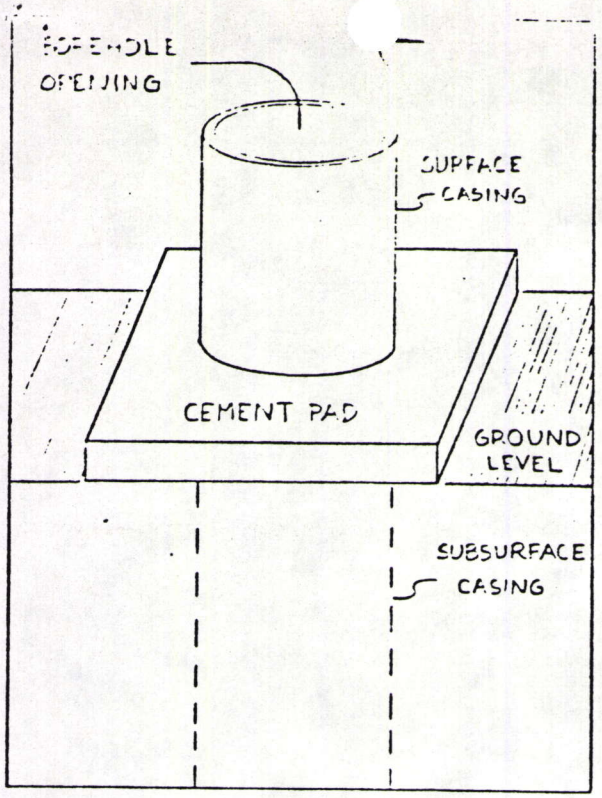
Boreholes used by Atlas Minerals for the ventilation of underground workings vary in diameter from 8 inches to 60 inches. Boreholes are either steel cased the entire length of the borehole or the casing extends approximately 20 to 30 feet beneath the surface. Whether a borehole is cased entirely or only cased near the surface depends on the nature of the subsurface material. If the subsurface material is determined to be stable (i.e. sloughing of hole will not occur, and no water bearing strata was encountered) then casing will only be placed near the surface, if the subsurface material is unstable the borehole will be cased its entire length. Any water bearing strata encountered is expected to be sealed by the borehole casing, no water bearing strata are encountered in boreholes which have been determined to be stable. The following description and diagrams list the recommended procedures to be followed for borehole sealing.

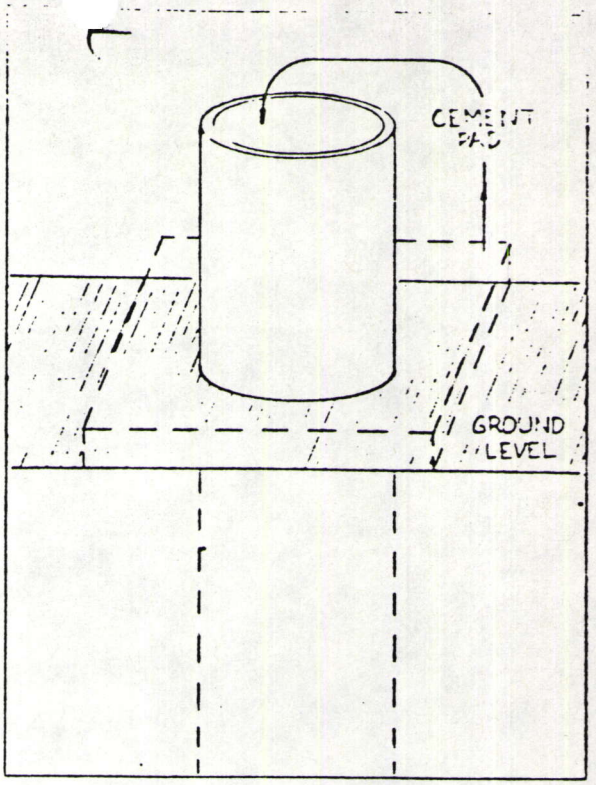
A. Where applicable the cement pad surrounding the borehole shall be broken up and placed into the borehole, as illustrated in diagram A.

B. If the surface surrounding the borehole is loose, the loose surface material shall be excavated to allow room for the casing to be cut approximately three feet beneath the ground surface (see diagram B). If the surface surrounding the borehole is solid rock, the casing shall be cut level with the exposed rock.

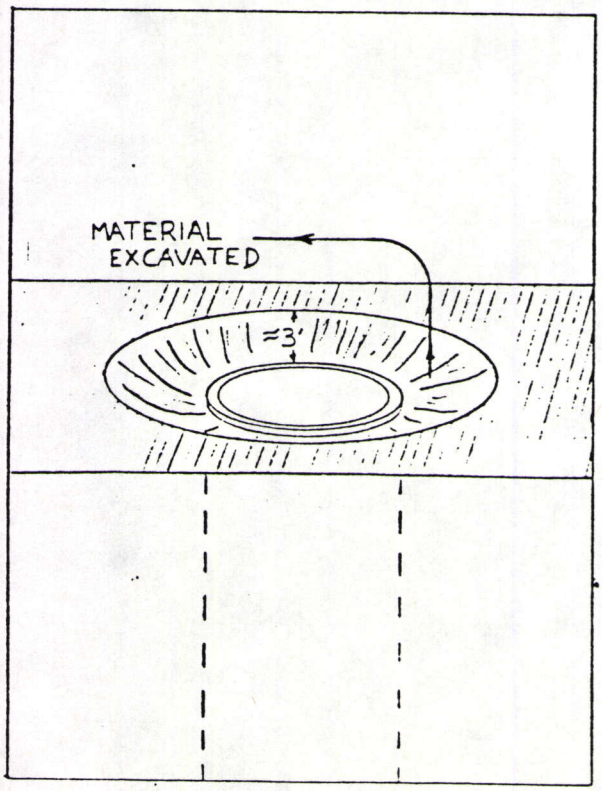
C. A steel plate shall be placed on top of the borehole and welded to the casing (see diagram C). The plate shall be of sufficient size and strength to protect the integrity of the surface contours.

D. Where applicable, material previously excavated will be placed back on top of the sealed borehole and regraded to natural contours, as shown in diagram D.

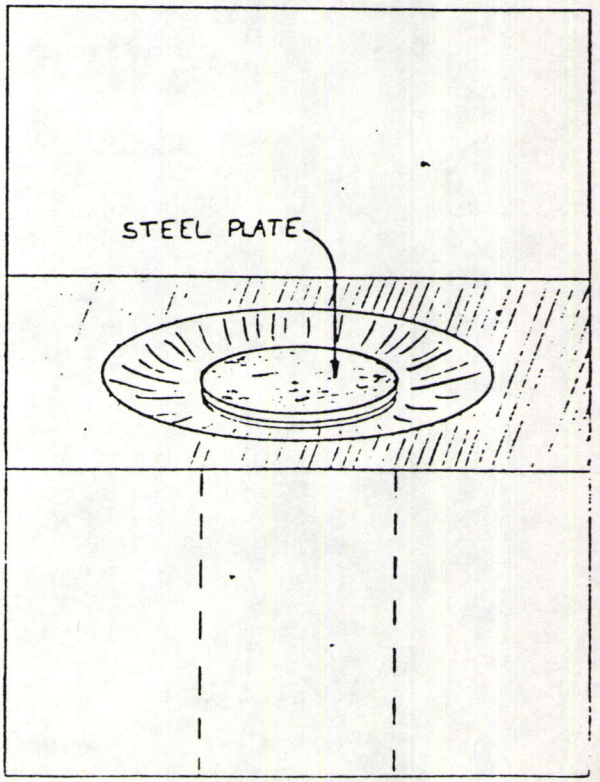




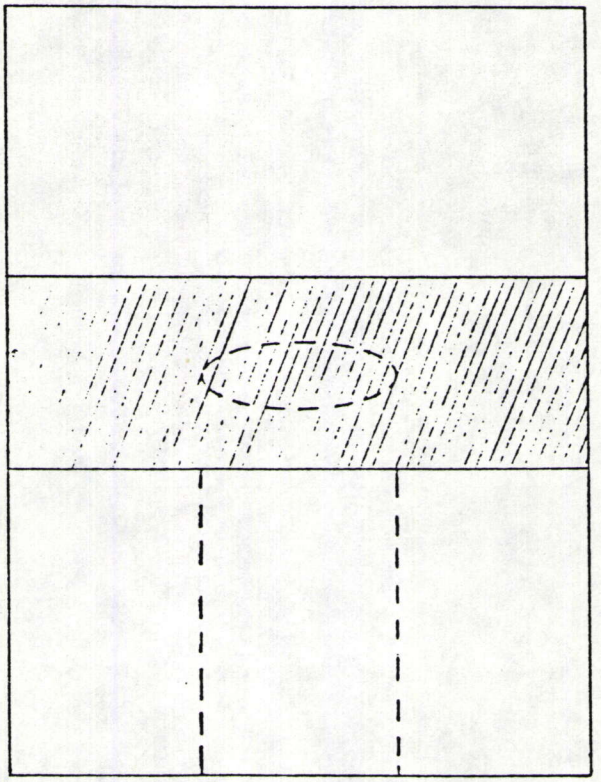
A. CEMENT PAD BROKEN UP AND REMOVED.



B. LOOSE MATERIAL REMOVED AND CASING CUT.



C. STEEL PLATE WELDED IN PLACE.



D. SURFACE REGRADED TO NATURAL CONTOURS.

II. PROCEDURE FOR PORTAL SEALING

Atlas Minerals uses portals as surface entrances to addits or declines to access underground workings. The average portal dimension is 9 feet X 12 feet. Sealing procedures for portals are discussed for two portal categories.

The first portal category involves portals that have their entrance locations adjacent to level ground. Sealing procedures shall utilize the surrounding waste rock to backfill the entrance, pushing as much waste rock into the opening as possible. The waste rock shall then be sloped to prevent surface drainage from entering the sealed portal.

The second portal category involves portals that have their entrance locations above level ground (e.g. portal entrances in cliffs), or portal entrance locations where it would not be feasible to backfill. Sealing procedures shall utilize explosive charges placed around the portal perimeter to seal the portal entrance.

III. PROCEDURE FOR SHAFT SEALING

Mine shafts used by Altas Minerals as vertical access to underground workings, will be sealed according to the following description.

A. Associated superstructure will be removed from the shaft opening, primarily the headframe, hoisting works, backleg structures, and the concrete pad.

B. The shaft will be backfilled using the surrounding waste rock until the waste rock reaches the ground surface.

C. Once the waste rock reaches ground level the surface will be graded to match existing surface contours, and prevent surface drainage from entering the sealed shaft.